

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NORTH CAROLINA
SOUTHERN DIVISION
No. 7:23-CV-897**

IN RE:
CAMP LEJEUNE WATER LITIGATION

This Pleading Relates to:
McElhiney v. United States, 7:23-cv-1368
Peterson v. United States, 7:23-cv-1576
Rothchild v. United States, 7:23-cv-858
Welch v. United States, 7:23-cv-1503
Sparks v. United States, 7:23-cv-682

**PLAINTIFFS' LEADERSHIP GROUP'S RESPONSE IN OPPOSITION
TO UNITED STATES' MOTION TO EXCLUDE THE GENERAL
AND SPECIFIC CAUSATION OPINIONS OF
DRS. RICHARD BARBANO, HEIDI SCHWARZ, AND KRISTIN ANDRUSKA**

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INTRODUCTION

Defendant attempts to weaponize scheduling orders and Rule 702 to exclude the relevant and reliable opinions offered by Drs. Richard Barbano, Heidi Schwarz, and Kristin Andruska. This pedantry belies the weakness of their position. Rule 702 is not a sword to be wielded against opinions Defendant dislikes; it is a shield to protect factfinders from unsupported theories. Likewise, this Court's pretrial scheduling orders are purposed to promote efficient resolution of this consolidated litigation—not to impose arbitrary constraints on an expert's ability to speak of his or her knowledge.

“[S]pecific causation experts may rely on general causation evidence to establish that an exposure can cause the disease.” [D.E. 444] at 4. That is all the Phase III Parkinson's disease experts have done here. Defendant argues that Drs. Barbano, Schwarz, and Andruska impermissibly “offer[ed] ‘new, independent general causation analyses,’” [D.E. 544] at 1–2 (citing [D.E. 444] at 4), and that these alleged analyses “failed to employ a proper methodology,” [D.E. 544] at 2. But Drs. Barbano, Schwarz, and Andruska are *not* independently opining on general causation, and the Plaintiffs *are not* relying on their opinions for general causation. The accusation otherwise is premised on Drs. Barbano, Schwarz, and Andruska's *agreement* with Plaintiffs' general causation experts and their independent review of sources underlying and relating to those experts' opinions. Defendant identifies nothing in Drs. Barbano, Schwarz, and Andruska's reports that either contradicts or adds to what was disclosed on general causation. *Cf.* [D.E. 444] at 4 (prohibiting use of Phase III expert disclosures to “present new general causation theories, fresh literature reviews, or threshold calculations”). That moots Defendant's motion to bar the Phase III experts from presenting non-existent novel general causation opinions.

Defendant separately dismisses Plaintiffs' Experts' differential etiologies, using scare quotes to imply they did not conduct real ““differential diagnoses.”” [D.E. 544] at 2. The

implication here is that Defendant is a greater authority on medical methodology than actual doctors who research and treat Parkinson's disease. This hubris is on full display in the Defendant's explanation of why Drs. Barbano, Schwarz, and Andruska's differential etiologies are insufficient, i.e., the experts did not consider certain Defendant-termed "risk factors" that the experts did not believe were sufficiently established causes of Parkinson's disease. There is no reason for the Court to credit Defendant's unscientific assertions over the reliable methodology of actual scientists.

LEGAL STANDARD

Rule 702 allows qualified expert testimony if it will help the trier of fact determine a disputed fact; is based on sufficient facts or data; results from reliable methodology; and reflects a reliable application of that methodology to the facts. Fed. R. Evid. 702. Rule 702 should be considered in the context of the Federal Rules of Evidence's "liberal thrust" and their "general approach of relaxing the traditional barriers to opinion testimony." *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 588 (1993) (cleaned up). Rule 702 imposes on courts a limited "gatekeeping" role to evaluate whether the proposed testimony would (1) be based on "scientific knowledge" and (2) "assist the trier of fact." *Id.* at 590–91. This "flexible" approach is focused "solely on principles and methodology, not on the conclusions that they generate." *Id.* at 595-96; *TFWS, Inc. v. Schaefer*, 325 F.3d 234, 240 (4th Cir. 2003). The Court's gatekeeping function is purposed "to avoid the potential pitfalls of junk science," *United States v. Bonner*, 648 F.3d 209, 215 (4th Cir. 2011), i.e., "unreliable nonsense opinions," *Alaska Rent-A-Car, Inc. v. Avis Budget Grp., Inc.*, 738 F.3d 960, 969 (9th Cir. 2013).

"It is not the role of the district court to make ultimate conclusions as to the persuasiveness of the proffered evidence." *Quiet Tech. DC-8, Inc. v. Hurel-Dubois UK Ltd.*, 326 F.3d 1333, 1341 (11th Cir. 2003). Nor may the district court evaluate "the persuasiveness of competing scientific

studies,” *id.* (citation omitted), or “[take] sides on questions that are currently the focus of extensive scientific research and debate,” *Milward v. Acuity Specialty Prods. Grp., Inc.*, 639 F.3d 11, 22 (1st Cir. 2011); *see also* *Sommerville v. Union Carbide Corp.*, 149 F.4th 408, 427 n.7 (4th Cir. 2025) (emphasizing “that a district court may not exclude expert testimony based on (1) its *mere disagreement* with an expert’s choice of data or (2) its *own* assessment of the correctness of an expert’s opinions”); *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 261 (4th Cir. 1999) (“[T]he court need not determine that the expert testimony a litigant seeks to offer into evidence is irrefutable or certainly correct.”). Instead, “‘questions regarding the factual underpinnings of the [expert witness]’ opinion, affect the weight and credibility’ of the witness’ assessment, ‘not its admissibility.’” *Bresler v. Wilmington Tr. Co.*, 855 F.3d 178, 195 (4th Cir. 2017) (quoting *Structural Polymer Grp. v. Zoltek Corp.*, 543 F.3d 987, 997 (8th Cir. 2008)).

“[A] minor flaw in an expert’s reasoning or methodology does not render the expert’s opinion inadmissible.” *Silicon Knights, Inc. v. Epic Games, Inc.*, No. 5:07-CV-275-D, 2011 WL 6748518, at *7 (E.D.N.C. Dec. 22, 2011) (Dever, J.) (citing *Celebrity Cruises, Inc. v. Essef Corp.*, 434 F. Supp. 2d 169, 179 (S.D.N.Y. 2006)). Instead, the flaw must be “large enough that the expert lacks ‘good grounds’ for his or her conclusions.” *Amorgianos v. Nat’l R.R. Passenger Corp.*, 303 F.3d 256, 267 (2d Cir. 2002) (quoting *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 746 (3d Cir. 1994)). Only when the conclusion is connected to the data by “ipse dixit” alone—and nothing else—may an expert be excluded. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). “[R]ejection of expert testimony is the exception rather than the rule.” *United States v. Ferncreek Cardiology, P.A.*, No. 5:17-CV-616-FL, 2025 WL 871616, (E.D.N.C. Mar. 20, 2025) (Flanagan, J.) (citing Fed. R. Evid. 702 advisory committee’s note to 2000 amendment).

ARGUMENT

“A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion.” Fed. R. Evid. 702. A witness’s qualifications are “liberally judged by Rule 702,” and “a person may qualify to render expert testimony in any one of the five ways listed” by the Rule. *Kopf v. Skyrms*, 993 F.2d 374, 377 (4th Cir. 1993). Drs. Barbano, Schwarz, and Andruska each possess knowledge, skill, experience, training, *and* education, directly relevant to the causal relationship between exposure to the water at Camp Lejeune and the five Bellwether Plaintiffs’ Parkinson’s disease.

Dr. Richard L. Barbano MD PhD is a Professor of Neurology at the University of Rochester and an attending physician in the Movement Disorders division of Rochester General Hospital, where he has served as Chief of Neurology and Chief of Physical Medicine and Rehabilitation. Barbano Rep. (McElhiney) at 1–2 (JA Ex. 528, D.E. 502-5)¹. Dr. Barbano has seen patients with Parkinson’s disease for over 32 years of clinical practice, Barbano Dep. 27:21–28:13 (JA Ex. 610, D.E. 509-8), and has authored over 60 peer-reviewed articles on “topics including viral effects on the nervous system, peripheral neuropathies, botulinum toxin use, dystonia, and Parkinson’s disease,” Barbano Rep. at 2, with one study focusing *specifically* on the relationship between dry-cleaning chemicals like PCE and TCE and Parkinson’s disease. *See* Ex. 1, E. Ray Dorsey et al., *Dry-Cleaning Chemicals and a Cluster of Parkinson’s Disease and Cancer: A Retrospective Investigation*, 39 *Mov. Disord.* 606 (2024). “[A]s part of [his] clinical practice,” Dr. Barbano conducts “literature review[s] for epidemiological studies and publications.” Barbano Dep. 31:4–22 (JA Ex. 610, D.E. 509-8). And in his work with the American Academy of Neurology Guidelines Development Committee, he was tasked with evaluating the strengths and weaknesses

¹ When an expert has provided separate reports for multiple Plaintiffs, only one report is cited unless the reports read differently.

of individual studies to determine how much the Committee should credit a study's findings. *Id.* 32:6–34:2.

Dr. Heidi Schwarz MD, a Professor of Clinical Neurology at the University of Rochester Medical Center, has spent over 30 years caring for patients with Parkinson's disease and has specifically studied the relationship between dry-cleaning chemicals, including TCE and PCE, and Parkinson's disease. Schwarz Rep. (Sparks) at 1 (JA Ex. 533, D.E. 502-10). In her practice as a board-certified neurologist, treating Parkinson's disease patients, Dr. Schwarz "always tr[ies to] understand why a p[atient] develops Parkinson's disease." Schwarz Dep. 96:13–97:20 (JA Ex. 611, D.E. 509-9). She is a qualified expert on "the etiology, diagnosis and management of Parkinson's disease." Schwarz Rep. (Sparks) at 1 (JA Ex. 533, D.E. 502-10).

Dr. Kristin Andruska MD, PhD is a neurologist, researcher, and movement disorders specialist. Andruska Rep. at 4 (JA Ex. 525, D.E. 502-2). Her extensive education was supported by a grant from the National Institute of Neurological Disorders and Stroke, during which she spent over a decade researching the genetic and molecular mechanisms of neurologic disease—including Parkinson's disease—utilizing cellular, animal, and human models. *Id.*

Defendant does not challenge their qualifications.² And it acknowledges that their methodology—differential etiology—is a "standard scientific technique" that "can be used to show specific causation."³ [D.E. 544] at 22 (citing *Westberry*, 178 F.3d at 262). Instead, the Defendant's

² Although Defendant does not challenge Dr. Barbano's qualifications as to his opinion on specific causation, it argues he has "inadequate qualifications" to opine on *general causation* because he is "neither an epidemiologist nor a toxicologist." [D.E. 544] at 3. While Dr. Barbano is not offering general causation opinions, his qualifications are directly relevant to whether chemicals like PCE and TCE can cause Parkinson's disease, i.e., "general causation."

³ Courts sometimes treat as interchangeable the terms differential etiology and differential diagnosis. This brief uses "differential etiology" because it is "the more precise term" for "the process of determining which of two or more causes is responsible for the patient's symptoms." *Hendrix ex rel. G.P. v. Evenflo Co.*, 609 F.3d 1183, 1195 (11th Cir. 2010)

criticism proceeds from an anachronistic understanding of idiopathic Parkinson's disease that turns a blind eye to the emerging consensus that environmental contaminants cause Parkinson's disease. That argument is both misinformed and an inappropriate *Daubert* exclusion basis as it asks the court to take sides in a scientific debate instead of policing the application of methodology.

Defendant's scheduling order argument fares no better. The Phase III experts necessarily had to form an opinion on whether there is a causal association between PCE/TCE and Parkinson's disease before they could opine on whether the specific plaintiffs' degree of exposure to those substances was sufficient to cause the disease. Here, they did so by analyzing and adopting the Phase II experts' general causation analysis. The Phase III experts do not offer, and Plaintiffs will not elicit at trial, any "new, independent general causation analyses." [D.E. 444] at 5.

I. Drs. Barbano, Schwarz, and Andruska's Differential Etiologies Are Properly Conducted and Admissible.

Drs. Barbano, Schwarz, and Andruska are "properly qualified medical expert[s,]" who "perform[ed] reliable differential diagnos[es] through which, to a reasonable degree of medical certainty, all other possible causes of the victims' condition [were] eliminated, leaving only the toxic substance as the cause." *Turner v. Iowa Fire Equip. Co.*, 229 F.3d 1202, 1209 (8th Cir. 2000). "[A] causation opinion based on that differential diagnosis should be admitted." *Id.*

A. Reliable Differential Etiologies Are Admissible Expert Testimony.

"Differential diagnosis, or differential etiology, is a standard scientific technique of identifying the cause of a medical problem by eliminating the likely causes until the most probable one is isolated." *Westberry*, 178 F.3d at 262. "[A] reliable differential diagnosis satisfies *Daubert* and provides a valid foundation for admitting an expert opinion." *Turner*, 229 F.3d at 1208 (citing Court of Appeals decisions, including *Westberry*, that "reason that a differential diagnosis is a tested methodology, has been subjected to peer review/publication, does not frequently lead to

incorrect results, and is generally accepted in the medical community”). Accordingly, “a differential diagnosis is presumptively admissible” and “a district court may exercise its gatekeeping function to exclude *only* those diagnoses that are *scientifically invalid*.” *Glastetter v. Novartis Pharms. Corp.*, 252 F.3d 986, 989 (8th Cir. 2001) (per curium) (emphasis added).

An expert’s application of differential etiology is reliable and admissible if he or she “show[s] that the steps taken as part of that analysis—the ‘ruling out’ and the ‘ruling in’ of causes—were accomplished utilizing scientifically valid methods.” *Milward v. Rust-Oleum Corp.*, 820 F.3d 469, 476 (1st Cir. 2016) (citing *Ruggiero v. Warner–Lambert Co.*, 424 F.3d 249, 254 (2d Cir. 2005)). “A reliable differential analysis requires an expert to ‘compile a comprehensive list of hypotheses that might explain’ a plaintiff’s condition.” *Chapman v. Procter & Gamble Distrib., LLC*, 766 F.3d 1296, 1310 (11th Cir. 2014) (quoting *Hendrix*, 609 F.3d at 1195). One “requirement” for admissibility is “that experts at least consider alternative causes.” *In re Paoli R.R. Yard PCB Lit.*, 35 F.3d at 759; *Westberry*, 178 F.3d at 265 (holding that a “differential diagnosis that fails to take serious account of other potential causes may be so lacking that it cannot provide a reliable basis for an opinion on causation”).

But an opinion “should not be excluded because the expert has failed to rule out every possible alternative cause of a plaintiff’s illness.” *Cooper v. Smith & Nephew, Inc.*, 259 F.3d 194, 202 (4th Cir. 2001); *Best v. Lowe’s Home Ctrs., Inc.*, 563 F.3d 171, 181 (6th Cir. 2009) (“[D]octors need not rule out every conceivable cause in order for their differential-diagnosis-based opinions to be admissible.”); *Johnson v. Mead Johnson & Co., LLC*, 754 F.3d 557, 563 (8th Cir. 2014) (The Eighth Circuit has “consistently ruled that experts are not required to rule out all possible causes when performing the differential etiology analysis.”); *Hendrix*, 609 F.3d at 1195 n.9 (an expert need not list *all* possible causes for the condition). Rather, courts trust “physicians to use

their knowledge and experience as a basis for weighing known factors along with the inevitable uncertainties to make a sound judgment.” *Engilis v. Monsanto Co.*, 151 F.4th 1040, 1053 (9th Cir. 2025) (cleaned up). Thus, “when an expert establishes causation based on a differential diagnosis, the expert may rely on his or her extensive clinical experience as a basis for ruling out a potential cause of the disease.” *Wendell v. GlaxoSmithKline LLC*, 858 F.3d 1227, 1237 (9th Cir. 2017) (finding an abuse of discretion where the district court excluded experts “because they could not completely rule out the possibility that [plaintiff’s condition] was idiopathic”).

An expert’s opinion should not be excluded because they do not eliminate every possible cause. “The fact that several possible causes might remain uneliminated . . . only goes to the accuracy of the conclusion, not to the soundness of the methodology.” *Jahn v. Equine Servs., PSC*, 233 F.3d 382, 390 (6th Cir. 2000) (quoting *Ambrosini v. Labarraque*, 101 F.3d 129, 140 (D.C. Cir. 1996)). “It is enough to eliminate potential causes ‘until reaching one that cannot be ruled out or determining which of those that cannot be excluded is the most likely.’” *United States v. Chikvashvili*, 859 F.3d 285, 294 (4th Cir. 2017) (quoting *Westberry*, 178 F.3d at 262). “[A]lternative causes suggested by a defendant normally affect the weight that the jury should give the expert’s testimony and not the admissibility of that testimony.” *Cooper*, 259 F.3d at 202; *see also Acadamey Bank, N.A. v. AmGuard Ins.*, 116 F.4th 768, 791 (8th Cir. 2024) (“[A] differential expert opinion can be reliable even with less than full information. Instead, such considerations go to the weight to be given the testimony by the factfinder, not its admissibility.” (citation omitted)), *reh’g denied*, No. 23-1375, 2024 WL 4499662 (8th Cir. Oct. 16, 2024). Thus, “any failure to take account of [alternate causes] merely provided material for cross-examination or opposing expert testimony.” *Id.*

Only when “an expert utterly fails to consider alternative causes or fails to offer an explanation for why the proffered alternative cause was not the sole cause” is exclusion warranted. *Cooper*, 259 F.3d at 202.

B. Drs. Barbano, Schwarz, and Andruska Conducted Proper Differential Diagnoses.

Dr. Barbano “review[ed] the relevant records and assess[ed] all of the available evidence to diagnose the disease and then consider[ed] all relevant potential causes” in performing differential etiology for Messrs. McElhiney and Peterson. Barbano Rep. (McElhiney) at 3. He considered the “multiple factors effecting the development of Parkinson’s disease, including certain genetic factors and environmental exposures,” though noted that “[t]hese factors are not mutually exclusive.” *Id.* at 13. In considering causes, Dr. Barbano was mindful of “the issue of trying to separate what are associations and what are causal risk factors” and the reality that many associations are not “causally related.” Barbano Dep. at 226:6–20 (JA Ex. 610, D.E. 509-8). Because Parkinson’s disease is multifactorial, Dr. Barbano noted, for the sake of his testimony in this case, “other risk factors for the development of Parkinson’s disease [are] irrelevant unless they were so overwhelming that [the] exposure to [TCE] . . . was non-contributory.” *Id.* at 230:6–231:5. Still, Dr. Barbano concluded “Mr. McElhiney does not have other risk factors that rise to the standard of ‘at least as likely as not’ other than his exposure to contaminated water at Camp Lejeune.” Barbano Rep. (McElhiney) at 13 (JA Ex. 528, D.E. 502-5). And he considered, and ruled out, demographic factors, genetics, mood disorders, head trauma, and other toxic exposures as possible causes of Mr. Peterson’s Parkinson’s disease—concluding “his exposure to trichloroethylene and PCE via contaminated water at Camp Lejeune is at least as likely as not to be a cause of Mr. Peterson’s Parkinson’s disease.” Barbano Rep. (Peterson) at 18–20 (JA Ex. 529, D.E. 502-6).

Dr. Schwarz “explored” “risk factors for Parkinson’s disease . . . as they relate[d]” to Messrs. Sparks and Welch, and “[b]ased on this analysis,” came to conclusions “regarding the likely etiology of Parkinson’s disease for [both] individual[s].” Schwarz Rep. (Sparks) at 9. In her analysis, Dr. Schwarz considered both “scientifically proven causes” and “potential causes for Parkinson’s disease that are based on an association between these factors and the incidence of Parkinson’s disease but are lacking a scientifically documented mechanism of causation.” *Id.* at 3. And she addressed, and “rule[d] out” each alternative potential cause as they applied to Messrs. Sparks and Welch. *See id.* at 12–15; Schwarz Rep. (Sparks) at 9–12 (JA Ex. 534, D.E. 502-11). Dr. Schwarz noted the scientific community’s understanding of the causes of Parkinson’s disease is “ever evolving” Schwarz Dep. 156:4–10 (JA Ex. 611, D.E. 509-9), and explained her choice not to considered other “potential causes” that are less supported by evidence:

[F]or instance, male sex. So we know that Parkinson’s disease is more common in men than in women, but that’s an association. But there are so many factors that may influence that, so that the XY chromosome may have absolutely nothing to do, and that’s what defines male sex. With the development of Parkinson’s, it may have to do that men are more exposed to toxins . . . there’s so many other confounding variables that may account for that association.

Id. at 154:24–155:17. These excluded variables are distinct from Camp Lejeune/TCE exposure which is supported by “strong epidemiologic data,” “strong toxicology data,” and scientifically viable mechanisms of action. *Id.* at 156:19–157:15.

Dr. Andruska “consider[ed] all potential and relevant causes” of Ms. Rothchild’s Parkinson’s disease to determine which were “more likely versus less likely given [Ms. Rothchild’s] history, [her] exam and [her] clinical context.” Andruska Dep. 220:20–221:12, 42:10–43:4 (JA Ex. 609, D.E. 509-7). She laid out both the genetics of Parkinson’s disease, *see* Andruska Rep. at 40–43 (JA Ex. 525, D.E. 502-2), and environmental factors “that can trigger Parkinson

disease [including] medications, poisoning, infections, injury, and toxins [like] TCE and PCE.” *Id.* at 44–46. Dr. Andruska described the “nuanced distinction between risk factors and causes.” Andruska Dep. 205:1–10 (JA Ex. 609, D.E. 509-7). A “risk factor, like age or sex, is not a determinant of Parkinson disease[,]” contrasting “environmental exposures [which] can be a cause of Parkinson disease.” *Id.* 205:3–21. And ultimately, Dr. Andruska concluded that Ms. Rothchild “does not have any other significant exposures or risk factors,” though because Parkinson’s disease is multifactorial, Dr. Andruska noted that even “if she did, it doesn’t negate the causality of her TCE and PCE exposure.” *Id.* 224:16–25. This allowed Dr. Andruska to conclude “to a reasonable degree of scientific and medical certainty that Ms. Rothchild’s exposure to the water at Camp Lejeune is at least as likely as not the cause of her Parkinson Disease.” Andruska Rep. at 64 (JA Ex. 525, D.E. 502-2).

C. Defendant’s Arguments Against Drs. Barbano, Schwarz, and Andruska’s Differential Diagnoses Rely on Misrepresentations of the Record, Science, and Caselaw.

To argue against the “presumptively admissible[,]” *Glastetter*, 252 F.3d at 989, and thoughtfully conducted, *see supra* § I.B, differential diagnoses done by Drs. Barbano, Schwarz, and Andruska, Defendant is forced to resort to repeat misrepresentation. *First*, Defendant mischaracterizes both plaintiff specific facts and scientific evidence to fault Plaintiffs’ experts for not favoring the Defendant’s preferred risk factors. *Moreover*, the Defendant disregards the testimony of Plaintiffs’ experts when those experts disagree with the Defendant’s preferred understanding of the science, attempting to weaponize the concept of idiopathy to absolve itself of liability. *Finally*, the admissibility standard the Defendant lays out cannot be supported by caselaw—including by the cases the Defendant cites.

1. Defendant confuses associations with risk factors and overlooks the expert explanation for ruling out other risk factors.

Defendant faults the Phase III Parkinson's disease experts for not considering age or sex as risk factors. [D.E. 544] at 26 and 29. That reflects a fundamental misunderstanding of differential diagnoses, which works by ruling out plausible potential causes, not non-causal associations. Demographic traits like age and gender are associations that "can't be the determining factor" in the development of Parkinson's disease. Schwarz Dep. 157:16–158:20 (JA Ex. 611, D.E. 509-9); *see also* Barbano Dep. 280:14–282:8 (JA Ex. 610, D.E. 509-8) (comparing the association between male gender and Parkinson's disease with the "association between being female and having prolonged labor"); Schwarz Rep. (Sparks) at 4 (JA Ex. 533, D.E. 502.10) ("Age itself is not thought of as a risk factor for PD, however, increased age allows for more exposure time to environmental toxicants and enough time for PD to manifest."). The Defendant's own Parkinson's disease specific causation expert agreed that "being male does not cause PD" and acknowledged the shortcomings of assigning causal weight to these sorts of associations. See Young Rep. (Sparks) at 26 (JA Ex. 556, D.E. 504-7) ("risk factors do not necessarily constitute mechanisms of causation[,] "emerge from population-level associations[,] and "do not singularly drive disease processes, known to be multifactorial.").

Other supposed-risk factors the Defendant faults Drs. Barbano, Schwarz, and Andruska's for not considering thoroughly enough are head trauma,⁴ herpes,⁵ coronary artery disease,⁶ "[non-

⁴ [DE 544] at 29 ("Dr. Schwarz failed to consider Mr. Sparks' head trauma caused by a multi-car car accident."), at 27 ("Dr. Barbano claimed that silence from the same treaters regarding Mr. Peterson's head injuries as a cause of his PD was sufficient proof that Mr. Peterson's PD was *not* caused by those head injuries.").

⁵ *Id.* at 26 (Dr. Barbano "wholesale reject[ed] risk factors for Mr. Peterson, such as a herpes infection and coronary artery disease.")

⁶ *Id.*

Camp Lejeune related] risk factors . . . cumulatively,”⁷ potential TCE-exposure “through work as a mechanic and [a] hobby of restoring cars,”⁸ and an additional “at least 14 potential risk factors” that include GERD, anxiety, and depression.⁹ Not one of these omissions warrants exclusion, *cf. Westberry*, 178 F.3d at 265–66, particularly not when the experts “explained why he [or she] did not believe that [alternate causes] accounted for [plaintiff’s injury].” *Id.* at 266.

The Phase III Parkinson’s disease experts have explained, thoroughly and often repeatedly, why they did not credit a particular risk factor. *See, e.g.*, Schwarz Dep. 166:4–167:2 (JA Ex. 611, D.E. 509-9) (traumatic brain injury is associated with Parkinson’s disease, garden variety head injury is not, and Defendant alleges only the latter¹⁰); Schwarz Rep. (Sparks) at 4 (JA Ex. 533, D.E. 502-10) (“Without a proven mechanism, it cannot be stated that TBI causes PD.”), *id.* at 10 (an “MRI of [Mr. Sparks’] brain showed no evidence of prior brain trauma allowing [Dr. Schwarz] to rule out this risk factor.”); Barbano Dep. 255:4–256:1 (JA Ex. 610, D.E. 509-8) (Dr. Barbano did not find Mr. Peterson’s diagnoses of GERD, coronary artery disease, or herpes “relevant to causality of his Parkinson’s disease.”), *id.* at 280:9–282:4 (Dr. Barbano considered only the risk “factors that are actually biologically plausible to be causative.”). But Defendant still claims these principled, science-based determinations amount to the experts impermissibly “setting [their] own

⁷ *Id.* at 8 (Dr. Barbano “failed to consider that other risk factors could have cumulatively caused Mr. McElhiney’s PD.”).

⁸ *Id.* at 26 (Dr. Barbano “ignore[ed] Mr. McElhiney’s potential exposures to TCE aside from Camp Lejeune water through his work as a mechanic and his hobby of restoring cars, even though Dr. Barbano also testified that he believes there is no safe level of exposure to TCE that could not cause PD.”).

⁹ *Id.* at 9 (“Dr. Barbano acknowledged dismissing at least 14 potential risk factors for Mr. McElhiney “as a group” without discussing them at all in his report.”)

¹⁰ Defendant points to a medical record Dr. Schwarz did not review to imply Mr. Sparks suffered head trauma significant enough to have caused his Parkinson’s disease, *see* [D.E. 544] at 14, but in doing so, misrepresents the record of this accident by flipping the order of events in order to imply, erroneously, that Mr. Sparks had blacked out due to head trauma.

parameters for what can and cannot constitute a risk factor for PD.” [D.E. 544] at 27. Even if that were a fair characterization, an expert is allowed to “rely on his or her extensive clinical experience as a basis for ruling out a potential cause of the disease.” *Wendell*, 858 F.3d at 1237.

As betrayed by Defendant’s refusal to grapple with the experts’ reasoning, the risk factor related objections are not real critiques of methodology, but instead simply disagreement with “the accuracy of the[ir] conclusions.” *Jahn*, 233 F.3d at 390 (citation omitted). And the law is clear. “The alternative causes suggested by a defendant ‘affect the weight that the jury should give the expert’s testimony and not the admissibility of that testimony,’ . . . unless the expert can offer ‘no explanation for why she has concluded [an alternative cause offered by the opposing party] was not the sole cause.’” *Westberry*, 178 F.3d at 265 (quoting *Heller v. Shaw Indus., Inc.*, 167 F.3d 146, 156–57 (3d Cir. 1999)).

2. Idiopathy is not a cause.

The final alternative “cause” Defendant faults Plaintiffs’ experts for not giving more weight to—“idiopathy”—is not a cause at all. Defendant seemingly defines an “idiopathic” disease as one that “present[s] without identifiable causes,” [D.E. 544] at 24,¹¹ and cites to Plaintiffs’ general causation expert Dr. Boehme’s report to claim “the majority of PD cases are considered ‘idiopathic’” *id.* at 30. This reliance is endemic of the semantic sleight of hand the Defendant seeks to take advantage of. *Compare id.* at 30 with Boehme Rep. at 4 (JA Ex. 121, D.E. 467-4) (“The majority of PD is *labeled* idiopathic. Idiopathic is a term used in clinical medicine when there is

¹¹ At other points Defendant implies that cases of Parkinson’s disease are idiopathic if they “have no *definitive* cause,” [DE 544] at 30 (emphasis added), but by that measure all-but signature diseases like mesothelioma would be idiopathic. Assigning a *definite* cause to a complex, multifactorial disease like Parkinson’s disease is beyond what’s possible in science or required in litigation. *See Daubert*, 509 U.S. at 590 (“[I]t would be unreasonable to conclude that the subject of scientific testimony must be ‘known’ to a certainty; arguably, there are no certainties in science.”); *Hendrix*, 609 F.3d at 1098 n.10 (describing use of “definitive” as “inappropriate” given *Daubert* requirement is for reliability, not certainty).

no known cause of a disease or condition[,] when other known causes have been ruled out[, or] to describe a condition for which a known cause has not yet been determined.” (emphasis added)). Defendant has framed plaintiffs’ experts’ efforts to clarify the concept of idiopathy as “[f]alling back on a ‘semantics’ argument.” [D.E. 544] at 29. But semantics matter—particularly where the Defendant’s entire argument is based on outdated terminology and its misunderstanding of a scientific concept.

As Plaintiffs’ experts have testified, the “understanding of the cause(s) of Parkinson’s disease has evolved significantly over the last 30 years.” Schwarz Rep. (Sparks) at 3 (JA Ex. 533, D.E. 502-10). This is unsurprising given that Parkinson’s disease is “the fastest growing neurological disorder in terms of prevalence.” Costa Rep. at 6 (JA Ex. 127, D.E. 467-10). And because “the projected increase in [Parkinson’s disease] incidence appears to outpace that of normal aging,” researchers have increasingly looked at “the primary environmental causes of the disease.” *Id.* This growing body of research has broadly undermined the idea that most cases of Parkinson’s disease can be considered idiopathic.

It’s true that “Parkinson’s disease was once called an idiopathic disease (i.e., one without a clear cause), but current research is now providing evidence through mechanistic and animal studies, for the scientific conclusion that environmental factors can be causative in the development of [Parkinson’s disease].” Schwarz Rep. (Sparks) at 3 (JA Ex. 533, D.E. 502-10). And while “[g]enetic susceptibility” is believed to “contribute to the development of” Parkinson’s disease in some patients, those patients do not develop Parkinson’s disease “without the contribution of another factor.” *Id.* This is consistent with the fact that the heritability estimate of Parkinson’s disease is “almost at the bottom of the list of common disorders with mixed etiology.” Costa Rep. at 7 (JA Ex. 127, D.E. 467-10).

The Defendant's own experts acknowledge these research developments. *See* Gollomp Rep. (Welch) at 5 (JA Ex. 549, D.E. 503-12) ("Some authorities believe that Parkinson's disease is predominantly an environmental disease . . .") But, like Defendant in its motion, they repeat the outdated dogma that most cases of Parkinson's disease "(estimated at around 70–80%)" are idiopathic. Young Rep. (Sparks) at 5 (JA Ex. 556, D.E. 504-7). But this claim is not only not supported by the current state-of-the-art science, it isn't supported by the authorities Dr. Young cites to—neither of which purport to estimate the rates of Parkinson's disease with no known cause. One of these articles specifically acknowledges "known genetic and environmental contributions." Ex. 2, Melissa Armstrong & Michael Okun, *Diagnosis and Treatment of Parkinson Disease: A Review*, 323 JAMA 2023 548, 549 (2020).

Advances in research allow for increased understanding of disease origins. *See* Barbano Rep. (McElhiney) at 11 (JA Ex. 528, D.E. 502-5) ("[I]n 1950 a long-time smoker with lung cancer would be labeled as 'idiopathic'; in 1980 that same lung cancer would be classified as lung cancer secondary to smoking."). In the Parkinson's disease context, linguistic practice has not necessarily kept pace with this changing landscape. "The term idiopathy in Parkinson's disease was coined in the '60s, '70s, '80s when we actually didn't have any idea what caused Parkinson's disease" and "is still use[d] as a way to distinguish between Parkinson's disease and atypical Parkinson's disease." Schwarz Dep. 94:12–96:2 (JA Ex. 611, D.E. 509-9); *see also* Andruska Dep. 226:9–16 (JA Ex. 609, D.E. 509-7) (describing the use of the term "idiopathic" among Parkinson's disease practitioners as "archaic").

Today the term "idiopathic Parkinson's disease" is used by many practitioners and academics to contrast with Atypical Parkinsonian Disorders or "rare, familial form[s]" of the disease, which present differently from the primary Parkinson's disease. Costa Rep. at 3, 6 (JA Ex.

127, D.E. 467-10). *See also*, De Miranda Rep. at 2 (JA Ex. 129, D.E. 467-12) (“[M]ost [Parkinson’s disorders are] considered idiopathic – a term suggesting that the underlying cause is spontaneous, and does not originate from inherited mutations alone.”), *id.* at 3; (“[A] large body of evidence suggests that environmental exposures heavily influence idiopathic [Parkinson’s disorder] risk.”). Thus, a “more useful concept might be ‘genetic’ vs ‘acquired’ with ‘acquired’ having unknown (‘idiopathic’), possible, and established causes.” Barbano Rep. (McElhiney) at 12 (JA Ex. 528, D.E. 502-5).

It is this semantic error that Defendant relies on to argue that “[w]hen there are many idiopathic cases of a particular disease, it is ‘impossible to ignore and difficult to rule out’ the possibility of idiopathy.” [D.E. 544] at 24 (quoting *Tamraz v. Lincoln Elec. Co.*, 620 F.3d 665, 675 (6th Cir. 2010), *overruled on other grounds by A.K. ex rel. Kocher v. Durham Sch. Servs.*, 969 F.3d 625 (6th Cir. 2020)). But the Defendant has not presented evidence to show that most cases of Parkinson’s disease fit its definition of idiopathic. Nor has it adequately argued that failure to consider idiopathy as a cause of the Plaintiffs’ Parkinson’s disease makes Plaintiffs’ Expert’s opinions unreliable. *Cf. Lightfoot v. Georgia-Pac. Wood Prods., LLC*, No. 7:16-CV-244-FL, 2018 WL 4517616, at *21 (E.D.N.C. Sept. 20, 2018) (Flanagan, J.) (“[C]onsideration that a disease is ‘idiopathic’ is not a required component of differential diagnosis.”).¹²

¹² Defendant suggests “*Lightfoot* is distinguishable to the present case” “because the experts in *Lightfoot* did ‘explain why they ruled out the possibility that plaintiff’s [cancer] was idiopathic under the circumstances of [that] case.’” [D.E. 544] at 25 n. 10 (quoting *Lightfoot*, 2018 WL 4517616, at *21). But this attempt to distinguish fails because Drs. Barbano, Schwarz, and Andruska *did explain* why they don’t think plaintiffs’ Parkinson’s diseases are idiopathic. *See* Barbano Dep. 187:21–188:22 (JA 610, D.E. 509-8); Schwarz Dep. 99:3–100:2 (JA 611, D.E. 509-9); Andruska Dep. 221:19–222:6 (JA 609, D.E. 509-7). Defendant just disagrees with those explanations.

While Defendant’s position finds support in *Tamraz*, the fifteen-year-old case does not reflect modern scientific understanding of Parkinson’s disease and is plainly distinguishable. *First*, science and language have developed in the years since. While the expert in *Tamraz* offered “a plausible hypothesis [that] may even be right” the supporting science did not yet bare that hypothesis out. 620 F.3d at 670. Today, there is far more scientific support for environmental causes of Parkinson’s disease. *See, e.g.*, Ex. 3, E. Ray Dorsey & Bastiaan Bloem, *Parkinson’s Disease Is Predominantly an Environmental Disease*, 14 J. Parkinsons Dis. 451 (2020). Moreover, the *Tamraz* court contrasted “idiopathic Parkinson’s Disease” with “postencephalitic parkinsonism” or “drug-induced parkinsonism” noting that “[o]ver time, as scientists have discovered more genetic and other causes for Parkinson’s Disease, the medical profession has defined more subclassifications of the disease.” 620 F.3d at 668. But those subclassifications are based on more than cause—they present differently than typical Parkinson’s disease. *See, e.g.*, Ex. 4, Francesco Brigo et al., *Differentiating drug-induced parkinsonism from Parkinson’s disease: An update on non-motor symptoms and investigations*, 20 Parkinsonism & Related Disorders 808 (2014). If a patient presents with standard Parkinson’s disease, the “practicing neurologists commonly diagnose patients with Idiopathic Parkinson’s Disease,” in part “because a causality assessment is not conducted” or necessary for treatment. Barbano Rep. (McElhiney) at 12 (JA Ex. 528, D.E. 502-5); *see also Jones v. Lincoln Elec. Co.*, 188 F.3d 709, 715–16 (7th Cir. 1999) (contrasting idiopathic Parkinson’s disease with “‘atypical’ Parkinsonism,” and noting “[a] person suffering from this [idiopathic Parkinson’s disease] will exhibit most, if not all, of the general Parkinsonian symptoms described above as the disease progresses”). And, as more causes of Parkinson’s disease have been discovered, what is termed “idiopathic Parkinson’s disease” is no

longer defined by its lack of cause. *See Costa Rep.* at 3 (JA Ex. 127, D.E. 467-10) (“Environmental factors are believed to be primarily responsible for the etiology of ‘idiopathic PD.’”).

Second, the plaintiff in *Tamraz* alleged his Parkinson’s disease was caused by overexposure to manganese. 620 F.3d at 668. Manganese exposure is linked to a form of parkinsonism known as manganism, which presents differently than typical Parkinson’s disease. *Id.* (“[S]ymptoms of manganism overlap with Parkinson’s Disease but include an action tremor instead of a rest tremor, symmetry of symptoms and a distinct gait.”). And “[e]pidemiological studies have failed to find a correlation between manganese and [typical] Parkinson’s disease.” *Id.* at 670 (citation omitted). Yet, plaintiff’s expert “repeatedly emphasized that he saw none of the symptoms of manganism in [plaintiff] and that his diagnosis was identical to Parkinson’s Disease.” *Id.* at 672. Thus, the court’s exclusion was in part because of the expert’s “speculative jump[.]” that “manganese in lower levels than necessary to cause manganism might nevertheless ‘trigger’ the symptoms of Parkinson’s Disease.” *Id.* at 669–70. Such complications do not exist in this case, where Plaintiffs’ exposure is linked to their specific diagnoses. A district court recently rejected the government’s invocation of *Tamaraz* to exclude etiologies based upon “issues [that] go to weight, not admissibility,” finding the case to be unique due to the “etiology opinion [that] was exceptionally tenuous, relying on unproven medical theories to explain causation.” *Groen v. United States*, No. 21-CV-12792, 2025 WL 947285, at *7 (E.D. Mich. Mar. 30, 2025). This Court should do the same.

3. The other cases cited by the Defendant do not bolster its position.

When offering its critique of Drs. Barbano, Schwarz, and Andruska’s differential diagnoses, the Defendant first cites *Westberry*—a case that clearly supports plaintiffs’ position. *See* 178 F.3d at 265 (holding “[a] medical expert’s causation conclusion should not be excluded because he or she has failed to rule out every possible alternative cause of a plaintiff’s illness” (quoting *Heller*, 167 F.3d at 156–57)). The other controlling cases cited by the Defendant,

likewise, do not support the stringent standards for differential etiologies the Defendant advocates for. While the *In re Lipitor* court excluded an unreliable differential diagnosis, the excluded expert “appeared to simply conclude that ‘so long as the patient took Lipitor and developed diabetes, then Lipitor was a substantial contributing factor.’” *In re Lipitor (Atorvastatin Calcium) Mktg., Sales Pracs., & Prods. Liab. Litig. (No II) MDL 2502*, 892 F.3d 624, 644–645 (4th Cir. 2018) (“*In re Lipitor*”) (quoting the district court). This “fail[ure] to adequately explain the basis for ruling out other contributing factors—including some that [the expert] herself described as substantial,” *id.* at 645, is obviously distinct from experts consciously not considering proposed associations they do not believe to be risk factors, *see supra* § I(C)(1). Unlike *In Re Lipitor*, Drs. Barbano, Schwarz, and Andruska “provide[d] reasonable explanation[s] as to why he or she has concluded that any alternative cause suggested by the defense was not the sole cause.” 892 F.3d at 644 (quoting *Best*, 563 F.3d at 179).

Similarly, the court in *Bryte ex rel. Bryte v. Am. Household, Inc.* concluded that the expert’s opinion was “contrary” to “common sense” and the proposed alternative cause was “more logical.” 429 F.3d 469, 477 (4th Cir. 2005). This allowed the court to clearly discern that alternative “possibilities ha[d] not been excluded in any methodical or reliable fashion.” *Id.* In *Cooper*, the “district court [was] justified in excluding the expert’s testimony” when the expert “categorically dismissed any suggestion that [plaintiffs’] smoking was the cause of the nonunion” despite “the medical literature [being] replete with evidence that smoking can cause nonunions to occur” and the plaintiff’s medical records indicating an overwhelming history of smoking. 259 F.3d at 202. The expert “read just two” of the many medical articles on this topic and rejected them as unpersuasive, stating “even if there were ten more articles, [he would not] change [his] mind about

it.” *Id.* This disregard of a wide body of literature is incomparable to Drs. Barbano, Schwarz, and Andruska choosing not to consider speculative causes.

Defendant cites *United States v. Alvarado* to suggest failure to properly consider alternative causes undermines Plaintiffs’ case on but-for causation because the Camp Lejeune exposure may “play[] merely a nonessential contributing role” in causation. [D.E. 544] at 25 (quoting *United States v. Alvarado*, 816 F.3d 242, 249 (4th Cir. 2016)). But Plaintiffs’ experts did properly consider possible causes, and importantly, *Alvarado* does not support the idea that but-for causation requires an agent to be the sole cause. *See id.* at 248 (an agent “qualifies as a but-for cause of death ‘if, so to speak, it was the straw that broke the camel’s back.’” (quoting *Burrage v. United States*, 571 U.S. 204, 211 (2014))).

To support its argument on idiopathy, Defendant points to several opinions that have little relevance, given the Defendant’s misuse of the concept, and limited persuasive value here. A 30-year-old Massachusetts district court opinion determined an expert’s “acknowledge[ment] that 90 percent of [disease] cases are of unknown cause added reason to doubt the validity of both his method of ‘differential diagnosis’ and his conclusion.” *Whiting v. Bos. Edison Co.*, 891 F. Supp. 12, 21 n.41 (D. Mass. 1995). The court’s objection to the methodology of a differential diagnosis “if 90 percent of the causes of a disease are unknown” was only one of the many flaws it identified in the expert’s testimony, *see, e.g., id.* at 19–24, which is why it only appears in footnote dicta, *see id.* at 21 n.41. Defendant separately points to the First Circuit’s determination that “the district court acted within its discretion to conclude that the extraordinary number of idiopathic [cases of a disease], coupled with the lack of a reliable means to rule out an idiopathic diagnosis here, muted [the expert’s] ability to reliably apply” a differential etiology. *Rust-Oleum Corp.*, 820 F.3d at 476. But that sentence—which begins “As such”—is dependent on the sentence

before it: “Given that the record does not contain a scientifically reliable basis to ‘rule in’ [the alleged cause], [the expert] needed some other method to “rule out” an idiopathic diagnosis. She did not provide one.” *Id.* The implication here is plain. If the plaintiff could reliably “rule in” that proffered cause, a differential diagnosis—that does not consider idiopathy as a cause—is proper.

Defendant further relies on *Bland v. Verizon Wireless, L.L.C.*, 538 F.3d 893, 897 (8th Cir. 2008), in which the Eighth Circuit affirmed the exclusion of an expert whose “attempt to use a differential diagnosis to establish [an agent] caused [plaintiff’s condition] fails because [the expert’s] own testimony acknowledged the cause of [the condition] in the majority of cases is unknown.” In addition to the problems with the differential etiology, the court found and based its opinion on the conclusion that the expert’s opinion was not supported by sufficient data. *Id.* The Eighth Circuit has subsequently characterized *Bland* as supporting the proposition “[w]hen an expert’s differential analysis fails to rule in exposure to the alleged cause at issue (general causation) and fails to rule out other possible causes, the specific causation opinion is not sufficiently reliable and should be excluded.” *Kirk v. Schaeffler Grp. USA, Inc.*, 887 F.3d 376, 392 (8th Cir. 2018) (citing *Bland*, 538 F.3d at 897–98). And it has repeatedly rejected the argument Defendant relies on it to make. See *Johnson*, 754 F.3d at 563; *Lauzon v. Senco Prods., Inc.*, 270 F.3d 681, 693 (8th Cir. 2001) (the requirement to rule out other possible causes “cannot be carried to a quixotic extreme”); *In re Prempro Prods. Liab. Litig.*, 586 F.3d 547, 566–67 (8th Cir. 2009) (rejecting the argument that expert testimony on the cause of plaintiff’s breast cancer must be excluded because the cause of breast cancer is generally unknown and because the plaintiff had known risk factors).

Other cases Defendant cites, like *Hall v. Conoco Inc.*, 886 F.3d 1308 (10th Cir. 2018) and *Kilpatrick v. Breg, Inc.*, 613 F.3d 1329, 1343 (11th Cir. 2010), were likewise based on more

fundamental flaws in an expert's methodology than failing to consider an injury's cause was idiopathic. In *Hall*, the court held “[g]iven predominance of idiopathic causes, we conclude that the district court had the discretion to consider [the expert’s] differential diagnosis unreliable,” but the district court’s unreliability determination was “based partly on his failure to justify ruling in” the agent he claimed was the most likely cause. *Hall*, 886 F.3d at 1312, 1315. And the Tenth Circuit expressly acknowledged that “an expert need not ‘categorically exclude each and every possible alternative cause.’” *Id.* at 1316 (citing *Bitler v. A.O. Smith Corp.*, 400 F.3d 1227, 1238 n.6 (10th Cir. 2005)). The *Kilpatrick* expert lacked the “key foundation for applying differential diagnosis” because the expert “only ruled out two causes” and “testified that he could not explain why potentially unknown, or idiopathic alternative causes were not ruled out.” 613 F.3d at 1343. Neither case is relevant here where plaintiffs’ experts properly rely on general causation testimony to rule in Camp Lejeune exposure and gave detailed explanations of why they did or did not consider various alternative causes, including idiopathy.

And Defendant overlooks cases that undercut their position. The Sixth Circuit upheld a decision where differential etiology was permitted despite “testimony from multiple experts that most testicular cancer is idiopathic.” *In re E. I. du Pont de Nemours & Co. C-8 Pers. Inj. Litig.*, 54 F.4th 912, 932 (6th Cir. 2022). And in *Hardeman v. Monsanto Co.*, 997 F.3d 941, 966–67 (9th Cir. 2021), the Ninth Circuit considered Monsanto’s argument that the plaintiff “failed to adequately rule out idiopathy, considering that 70% or more of NHL cases have unknown causes[.]” but held that “the evidence provided a sufficient basis for reliably ruling out idiopathy by concluding glyphosate was a substantial cause of Hardeman’s NHL.” *Id.*¹³

¹³ Interestingly, even Monsanto “acknowledge[d] that an expert can rule out idiopathy by reliably concluding that the known factor (here, glyphosate) is a “substantial cause[.]” *Hardeman*, 997 F.3d at 966.

II. Drs. Barbano, Schwarz, and Andruska Properly Opined on Specific Causation.

Drs. Barbano, Schwarz, and Andruska relied on the opinions and evidence laid out in the PLG's general causation reports to conclude that "exposure to the water at Camp Lejeune[]" is clearly an appropriate factor to consider when conducting a causality assessment using a differential diagnosis for Parkinson's Disease." Barbano Rep. (McElhiney) at 14 (JA Ex. 528, D.E. 502-5). Put differently, the general causation evidence was such that Drs. Barbano, Schwarz, and Andruska were able to "'rule in' the suspected cause" of exposure to the contaminated water at Camp Lejeune. *Cavallo v. Star Enters.*, 892 F. Supp. 756, 771 (E.D. Va. 1995), *aff'd in relevant part*, 100 F.3d 1150 (4th Cir. 1996). In litigation, an expert may "properly rel[y], in part, on the opinions and findings of [another expert witness] in forming his own opinions." *Nix v. Chemours Co. FC, LLC*, No. 7:17-CV-189-D et al., 2025 WL 2924613, at *21 (E.D.N.C. Sept. 30, 2025). That is what Drs. Barbano, Schwarz, and Andruska did here.

Plaintiffs neither offer nor rely on Drs. Barbano, Schwarz, and Andruska for general causation opinions. This fundamental fact makes quick work of Defendant's arguments that 1) Drs. Barbano, Schwarz, and Andruska's opinions on general causation are untimely and 2) that Drs. Barbano, Schwarz, and Andruska's general causation methodology is unreliable. These arguments seem to rest on the premise that any critical appraisal of general causation evidence and testimony done by a specific causation expert amounts to an independent opinion. This rationale asks the Court to punish Drs. Barbano, Schwarz, and Andruska for carefully considering the opinions on which they rely and, if applied, the rationale creates perverse incentives for specific causation experts to blindly adopt opinions they may or may not actually agree with.

A. **Drs. Barbano, Schwarz, and Andruska’s Reliance on General Causation Opinions and Published Literature is Proper Under the Court’s Phase III Order.**

General and specific causation are not separate elements of plaintiffs’ claims. The distinction is, instead, an organizational tool to ensure that issues of causation simpliciter are fully considered.” [D.E. 227] at 4. But “[c]ausation subsumes all three.” *Id.* While toxic tort cases often distinguish between “two levels of causation[:] ‘general causation’ and ‘specific causation[,]’” *Zellers v. NexTech Ne., LLC*, 533 F. App’x 192, 196 n.6 (4th Cir. 2013), this distinction is a “device[] to organize a court’s analysis.” Restatement (Third) of Torts: Liability for Physical and Emotional Harm § 28 cmt. (c)(1). General and specific causation “are not ‘elements’ of a plaintiff’s cause of action.” *Id.* Indeed, the two inquiries are interrelated and “establishing general causation is an essential prerequisite to proving specific causation.” *In re Bausch & Lomb Inc. Contacts Lens Sol. Prods. Liab. Litig.*, 693 F. Supp. 2d 515, 519 (D.S.C. 2010) (citation omitted), *aff’d sub nom. Fernandez-Pineiro v. Bausch & Lomb, Inc.*, 429 F. App’x 249 (4th Cir. 2011). “Each Phase informs the next—like building blocks in the parties’ cases in chief.” Dkt. No. 444 at 5. For that reason, “[c]ourts recognize that specific causation experts may rely on general causation evidence to establish that an exposure can cause the disease at issue.” *Id.* at 4 (citing *Westberry*, 178 F.3d at 262).

Given the related nature of Phases II and III, limiting specific causation testimony like the Defendant advocates for here “would frustrate the court’s intent.” *Id.* at 5. “Allowing Phase III experts to explain why they ‘ruled in’ contaminants” as Drs. Barbano, Schwarz, and Andruska did in their specific causation opinions “promotes adjudication on the merits.” *Id.* at 7–8. Thus, their opinions “may reference general causation evidence, including Phase II opinions and published literature,” and those “references are not untimely” because “they are not accompanied by novel opinions.” *Id.* at 8, 6.

B. Drs. Barbano, Schwarz, and Andruska did not offer novel opinions.

The Phase III Parkinson's disease experts appropriately explained why they were adopting the Phase II general causation expert's conclusion on the links between PCE/TCE and Parkinson's disease. In opining on the causal relationship between exposure to the water at Camp Lejeune and plaintiffs Gary McElhiney and Edgar Peterson's Parkinson's disease, Dr. Barbano "reviewed, considered and understand [sic]" the reports of PLG's general causation experts Drs. Boehme, De Miranda, Miller, Cannon, Costa, Freeman, and Bird that "set out in detail" the "causal relationship between the water at Camp Lejeune (most notably TCE and PCE) and Parkinson's disease" in general. Barbano Rep. (McElhiney) at 14 n.1 (JA Ex. 528, D.E. 502-5). As a diligent scientist, Dr. Barbano "read through those general causation reports" to confirm they were consistent with "[his] understanding of Parkinson's disease" and that "the pathology, the pathophysiology and the biology seemed reasonable." Barbano Dep. 70:5–71:1 (JA Ex. 610, D.E. 509-8). He did not "perform any independent analysis of the findings of the[general causation] reports," *Id.* 71:2–4, and he "deferred to [those witnesses'] specific expertise" Barbano Rep. (McElhiney) at 14 n.1 (JA Ex. 528, D.E. 502-5). For example, while Dr. Barbano's "general knowledge of chemistry and the inspection of the molecules," Barbano Dep. 179:19–180:7 (JA Ex. 610, D.E. 509-8), supported the conclusions that "TCE and PCE are structurally similar" and "no significant difference between the two chemicals [indicates] that PCE would not be equally toxic," this opinion relied upon and cited Dr. Cannon's general causation report. Barbano Rep. (McElhiney) at 14 (JA Ex. 528, D.E. 502-5). Similarly, Dr. Barbano adopted the chemical exposure calculations done by Dr. Reynolds for Mr. McElhiney and Peterson, *id.* at 15–16, and relied on the "minimal exposures calculated by Dr. Miller and Costa" to conclude Mr. McElhiney and Peterson's exposures were hazardous, Barbano Dep. 239:16–240:10 (JA Ex. 610, D.E. 509-8).

Dr. Schwarz “reviewed reports from toxicologists and epidemiologists who provided expert opinions in this case” when considering the causal relationship between exposure to the water at Camp Lejeune and plaintiffs Richard Sparks and Robert Welch’s Parkinson’s disease. Schwarz Rep. (Sparks) at 7 (JA Ex. 533, D.E. 502-10); *see also* Schwarz Dep. 57:15–23 (JA Ex. 611, D.E. 509-9) (Dr. Schwarz “relied on” the reports of Drs. Cannon, Boehme, Costa, De Miranda, and Miller). She separately “reviewed the materials cited in their reports to understand and verify that their opinions [we]re well reasoned and supported,” ultimately characterizing those reports as “rigorous and thorough” and concluding that “the overwhelming evidence,” as laid out in the general causation reports, “strongly supports a causal relationship between TCE exposure and development of PD.” Schwarz Rep. (Sparks) at 2, 7, 12 (JA Ex. 533, D.E. 502-10). While she did not perform “an independent analysis of the findings in these reports[,]” she did do a more thorough review when a report “presented data that [she] hadn’t heard before” in order to determine “how [the general causation expert] based their information.” Schwarz Dep. 123:15–125:13 (JA Ex. 611, D.E. 509-9). And in this process, Dr. Schwarz “didn’t find anything that [she] disagree[d] with” in the opinions she ultimately relied upon. *Id.*

Dr. Andruska’s opinions on the causal relationship between exposure to the water at Camp Lejeune and plaintiff Diane Rothchild’s Parkinson’s disease “are based on [her] reliance on general causation [opinions].” Andruska Rep. at 6 (JA Ex. 525, D.E. 502-2). Dr. Andruska offered no “toxicity threshold calculations,” *cf.* [D.E. 444] at 4, nor did she “calculate the amount of [neurotoxins] that Ms. Rothschild was exposed to during her time at Camp Lejeune,” Andruska Dep. 191:22–192:12 (JA Ex. 609, D.E. 509-7). Instead, she “relied on Dr. Reynolds” after speaking with her “to make sure [Dr. Andruska] understood [Dr. Reynolds’] calculations.” *Id.* 192:13–21. Dr. Andruska also “considered the expert reports of Drs. Boehme and Cannon,”

Andruska Rep. at 64 (JA Ex. 525, D.E. 502-2), as well as the reports of Drs. Miller and Costa Andruska Dep. 185:1–186:19 (JA Ex. 609, D.E. 509-7), and Dr. Andruska “agree[d] with their review of the literature, opinions, and the basis for their opinions.” Andruska Rep. at 64 (JA Ex. 525, D.E. 502-2). In making that determination, Dr. Andruska did “look at the quality of the [underlying evidence], at the authors, at conflicts of interests, at their methods and so on.” Andruska Dep. at 33:1–19 (JA Ex. 609, D.E. 509-7). Doing so was “not only for the purpose of this report but also as [part of her] general practice to stay current in the field.” Andruska Rep. at 6 (JA Ex. 525, D.E. 502-2).

CONCLUSION

For the foregoing reasons, Plaintiff opposes the Defendant’s requests that this Court exclude the general and specific causation opinions of Dr. Richard Barbano, Dr. Heidi Schwarz, and Dr. Kristin Andruska.

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